AMENDMENTS TO THE SPECIFICATION:

Page 1, amend the heading at line 10 as follows:

BACKGROUND ~~OF THE INVENTION~~

Page 4, amend the heading at the first line as follows:

SUMMARY ~~OF THE INVENTION~~

Page 4, amend the paragraph beginning at line 18 as follows:

An object ~~of the invention~~ is to achieve a solution for managing radio resources for providing wireless access to a communication system consisting of access networks using different access technologies, and wherein the solution can easily be adapted to manage radio resources for providing wireless access to a system that is expanded with new access networks using new access technologies.

Page 4, delete the paragraph beginning at line 24 which starts with "The above stated object . . . ."

Page 4, amend the paragraph beginning at line 27 as follows:

The solution ~~according to the present invention~~ makes it possible to manage radio resources in a communication system consisting of access networks using different access technologies. By extracting access relevant information from existing messages within an access network, a new access network using a new technology can easily be added to the communication system and managed by a solution for managing radio resources according to the invention.

Page 4, amend the paragraph beginning at line 34 and continuing to page 5, line 12 as follows:

According to a first aspect ~~of the present invention~~, a method is provided for managing radio resources for providing wireless access to a communication system to a number of terminals. The communication system comprises a first access network using a first access technology and at least one second access network using at least one second access technology different from the first access technology. The method comprises the step of receiving access relevant information from the first access network and the at least one second access network, wherein the received access relevant information comprises information extracted from messages sent within the first access network. The method further comprises the step of comparing the received access relevant information extracted from messages sent within the first access network to access relevant information received from the at least one second access network. The method also comprises the step of determining which access network a terminal should access, based at least on the comparison of the received access relevant information extracted from messages sent within the first access network to the access relevant information received from the at least one second access network.

Page 5, amend the paragraph beginning at line 14 as follows:

According to a second aspect ~~of the invention~~, a system is provided for managing radio resources for providing wireless access to a communication system to a number of terminals. The communication system comprises a first access network using a first access technology and at least one second access network using at least one second access technology different to the first access technology. The system for managing radio resources comprises at least one listening

agent arranged for extracting access relevant information for at least the first access network from messages sent within at least the first access network and sending the access relevant information to an access selection manager. The system for managing radio resources also comprises an access selection manager arranged for comparing the received access relevant information extracted from the first access network to access relevant information received from the at least one second access network. The access selection manager is also arranged for determining which of the first access network and the at least one second access network a terminal should access based at least on the comparison of the access relevant information extracted from the first access network to the access relevant information received from the at least one second access network.

Page 5, amend the paragraph beginning at line 31 and continuing to page 6, line 3 as follows:

According to a third aspect ~~of the invention~~, a listening agent is provided for that is used in a system for managing radio resources for providing wireless access to a communication system to a number of terminals, wherein the communication system comprises a first access network using a first access technology and at least one second access network using at least one second access technology different to the first access technology. The listening agent is arranged for extracting access relevant information for at least the first access network from messages sent within at least the first access network. The listening agent is also arranged for sending the access relevant information to an access selection manager.

Page 6, amend the paragraph beginning at line 5 as follows:

According to a preferred example embodiment ~~of the invention~~, the access relevant information is found by sniffing the messages sent within the first access network.

Page 6, amend the paragraph beginning at line 8 as follows:

An advantage of the ~~invention~~technology is that it achieves efficient radio resource management in a multi-access communication system that is expanded with a new access network using a different access technology than used before in the system. Especially the invention achieves efficient radio resource management in a multi-access communication system comprising Wireless LANs and GSM and/or WCDMA networks. A further advantage is that it makes it possible to use equipment in the new access network developed by different vendors without demanding standardisation of any new interfaces.

Page 6, delete the paragraph beginning at line 15 which starts with "A further advantage . . . ."

Page 6, amend the paragraph beginning at line 19 as follows:

Further advantages ~~of~~and embodiments ~~of the present invention~~ will become apparent when reading the following detailed description in conjunction with the drawings.

Page 6, amend the paragraph beginning at line 25 as follows:

Figure 1 shows a schematic block diagram of a communication system ~~wherein the present invention may be used~~.

Page 6, amend the paragraph beginning at line 28 as follows:

Figure 2 is a schematic block diagram illustrating an example embodiment ~~of the present invention~~ for managing radio resources in a multi-access communication system.

Page 6, amend the paragraph beginning at line 31 as follows:

Figure 3 shows a schematic block diagram of a listening agent and an access selection manager for managing radio resources according to an example embodiment ~~of the invention~~.

Page 6, amend the paragraph beginning at line 34 as follows:

Figure 4 shows a schematic block diagram of a GSM/WCDMA network with existing internal interfaces ~~wherein the present invention may be used~~.

Page 7, amend the paragraph beginning at line 1 as follows:

Figure 5 is a schematic block diagram illustrating a preferred example embodiment ~~of the invention~~ where a listening agent is placed in a Layer 2 Switch in a WLAN network.

Page 7, amend the paragraph beginning at line 13 as follows:

Figure 9 shows a flowchart describing a method according to an example embodiment ~~of the present invention~~.

Page 7, amend the paragraph beginning at line 18 as follows:

~~The present invention will be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown.~~ This ~~invention~~technology may~~, however,~~ be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided as examples.~~so that this disclosure will be thorough and complete, and will fully convey the~~

~~scope of the invention as defined in the appended claims to those skilled in the art.~~ In the drawings, like numbers refer to like elements.

Page 7, amend the paragraph beginning at line 26 as follows:

Figure 1 shows a typical multi access communication system ~~where the present invention may be used,~~ comprising a WCDMA/GSM network 110 and a WLAN network 120. The figure also shows a terminal 130 capable of communicating with both the WCDMA/GSM network 110 and the WLAN network 120. The terminal 130 comprises a terminal equipment 131, which is for example a general purpose computer such as a Personal Digital Assistant (PDA) or a laptop, and a mobile terminal 132, 133 containing access specific functions for accessing each different access technology network. In the figure, the access specific functions comprises a WLAN transceiver (WLAN-MT) 133 for communicating with the WLAN network 120 and a combined WCDMA/GSM transceiver (WCDMA/GSM-MT) 132 for communicating with the WCDMA/GSM network.

Page 9, amend the paragraph beginning at line 10 as follows:

~~According to the invention, t~~The access relevant information from at least a first access network is extracted from messages sent within at least the first access network. Thereafter, the access relevant information from at least the first access network is compared to the access relevant information received from the at least one second access network, and further it is determined which access network a terminal should access based on the comparison of the access relevant information extracted from messages sent within the first access network to the access relevant information received from the at least one second access network.

Page 9, amend the paragraph beginning at line 28 and continuing to page 10, line 2 as follows:

According to this exemplary embodiment ~~of the invention~~, a number of first listening agents 203 placed in the WLAN network 120 sniffs existing messages distributed within the WLAN network with the purpose to find access relevant information in the messages. To sniff a message means to read not only the source and destination address of a message but also the data of the message without influencing the message. The sender and the receiver of the message do not need to know that the message was sniffed. The messages that are sniffed in the WLAN network 120 comprise access relevant information such as for example the WLAN SS measurements sent from the WLAN-MT 133 to the WLAN network 120 and/or information regarding the load in the WLAN network, such as the load of the access point that the WLAN-MT 133 has a radio connection with.

Page 10, amend the paragraph beginning at line 32 as follows:

Also, at least part of the access relevant information from the WCDMA network could, ~~according to the invention,~~ except from being extracted from existing messages within the WCDMA network, also be obtained as standardised messages received on a dedicated channel from the WCDMA network to the access selection manager, e.g. from a common radio resource management server in the WCDMA network.

Page 11, amend the paragraph beginning at line 1 as follows:

Figure 3 is a schematic block diagram illustrating an embodiment of a listening agent 203 and an access selection manager 201 ~~according to the present invention~~. The listening agent 203 is placed in a node in an access network, and it comprises a listening unit 301 that is arranged to

sniff messages sent within the access network and to extract access relevant information from the sniffed messages. The listening agent 203 also comprises a communication interface 302 that is arranged to send the extracted access relevant information to the access selection manager 201. The access selection manager 201 comprises a communication interface 303 arranged to receive the access relevant information from the listening agent 203. The access selection manager 201 is illustrated with a single communication interface 302, but it is also possible, and probable, that the access selection manager has several communication interfaces communicating with several listening agents. The access selection manager also comprises a processing unit 304 arranged to compare access relevant information received from listening agents placed in different access networks. The processing unit 304 is also arranged to determine which of the different access networks a terminal should access based on the comparison of the access relevant information received from the listening agents placed in the different access networks. Since the determination may result in a handover decision from one access network to another access network, the access selection manager may also comprise a sending unit 305 that is arranged to communicate handover decisions from the access selection manager 201 to the terminal 130. Alternatively, handover decisions may be communicated to one or both involved access networks, which then initiates a network controlled handover.

Page 11, amend the paragraph beginning at line 26 and continuing to page 12, line 18 as follows:

Figure 4 shows a WCDMA/GSM network 110 comprising a WCDMA radio access network (UTRAN) 401 and a GSM EDGE radio access network (GERAN) 402, connected by a core network 112. In this figure, existing internal interfaces are shown over which interfaces

messages are sent that comprise access relevant information. Listening agents ~~according to the invention~~ may be used anywhere in this network to sniff messages sent over the internal interfaces and extract the access relevant information from the messages sent over the shown internal interfaces in the WCDMA/GSM network. The WCDMA radio access network 401 comprises among other things an RNC 113 and a Node B 114, 115. The GSM EDGE radio access network 402 comprises among other things a BSC 116 and a BTS 117, 118. Messages sent over the A/Gb-interface 406 between the GERAN 402 and the core network 112 may comprise access relevant information such as handover/relocation information (i.e. information necessary for performing a handover) and load information that could be sniffed and extracted according to the invention. Other examples of interfaces over which messages are sent that may comprise access relevant information such as handover/relocation information and load information that could be sniffed and extracted according to the invention are the Iu-interface 404 between the UTRAN 401 and the core network 112, the Iurg-interface 407 between the UTRAN 401 and the GERAN 402, the Iub-interface 410 between a Node B 114, 115 and an RNC 113, the Abis-interface 411 between a BTS 117, 118 and a BSC 116, and the Iur-interface 405 between RNCs 113 within the UTRAN 401. It would also be possible to sniff and extract access relevant information from messages sent over an interface 408 between a common radio resource management (CRRM) server 403 and the UTRAN 401, and over an interface 409 between the CRRM server 403 and the GERAN 402. The CRRM server collects cell load information from RNCs and BSCs, information that is used to handle radio resources in a communication system comprising only a WCDMA/GSM network 110. The CRRM server and its function is described in prior art document 3GPP TR 25.891 V0.3.0 mentioned above.

~~According to the invention, l~~Listening agents may be situated in both the CRRM server and in nodes in the WCDMA/GSM network.

Page 12, amend the paragraph beginning at line 20 as follows:

In figure 5 an exemplary embodiment ~~of the invention~~ is shown where access relevant information is extracted from messages communicated within a WLAN network according to the Inter Access Point Protocol (IAPP). The IAPP is a communication protocol used by the management entity of an access point 124 to communicate with other access points 125, 126, 127 when various local events occur in the access point 124. A listening agent 501, 502 placed at a node that connects access points can sniff IAPP messages communicated between these access points, extract access relevant information from the IAPP messages and send the information to the access selection manager 201. A listening agent can suitably be placed within a layer 2 switch 122, 123, which is directly connected to one or more access points 124, 125, 126, 127. By placing the listening agents in the layer 2 switches 122, 123 the number of listening agents necessary for detecting access relevant information for the terminals in the network will be minimized. The access relevant information is received ~~according to this embodiment of the invention~~ by sniffing either IAPP ADD-notify messages and IAPP MOVE-notify messages or layer 2 update frames, which are sent after a terminal has associated or reassociated with a new access point, i.e. after a terminal has connected or reconnected with a new access point. By listening to these messages, information of the source and/or destination access point for the communication exchange as well as terminal identity can be detected and extracted from the messages. The information of source and destination access point for a communication exchange can be used in the access selection manager to e.g. calculate the load of an access point. The

process of extracting this access relevant information is shown below in association with figure 6 for IAPP ADD-notify messages, in association with figure 7 for IAPP MOVE-notify messages and in association with figure 8 for Layer 2 update frame messages.

Page 14, amend the paragraph beginning at line 19 and continuing to page 15, line 5 as follows:

In case of encrypted communication it is possible that the IAPP communication is encrypted. Then information cannot be extracted from the IAPP MOVE-notify and IAPP ADD-notify messages, but it is still possible to listen to Layer 2 update frame messages, for example by a listening agent placed in the Layer 2 switch. The Layer 2 update frame messages follows IAPP MOVE-notify messages and IAPP ADD-notify messages. The Layer 2 update frame message is an 802.11 type 1 Logical Link Control (LLC) Exchange Identifier (XID) Update response frame with the content shown in figure 8. The Layer 2 update frame message 800 contains a MAC destination address (MAC DA) 801, which is the broadcast MAC address to all devices connected to this segment, and a MAC source address 802, which is the MAC address of the terminal that has associated/reassociated. It also contains information about frame length 803, destination service access point (DSAP) 804, source service access point (SSAP) 805, a control bit 806 and an XID information field 807. DSAP and SSAP are used to identify which upper layer protocol that is used. The purpose of the Layer 2 update frame message is to update all Layer 2 devices (e.g. bridges, switches and other access points) in order for them to reach the new location (access point) of the terminal. ~~According to the invention, a~~A listening agent that is placed in the nearest layer 2 switch listens to this Layer 2 update frame message, extracts the information about the terminal address in the MAC source address field 802 and sends this

information together with the ID of the new access point to the access selection manager. The ID of the new access point is extracted by identifying which port this message is received on in the layer 2 switch. The access selection manager then knows that a terminal with this MAC address has reassociated with the new access point that sent this message.

Page 15, amend the paragraph beginning at line 32 and continuing to page 16, line 3 as follows:

Below another exemplary embodiment ~~of the invention~~ is shown describing how access relevant information can be extracted from messages communicated within a WLAN network. In this exemplary embodiment, access relevant information is extracted from messages sent according to a protocol called Light Weight Access Point Protocol (LWAPP). LWAPP is a protocol allowing a router or switch to interoperably control and manage a collection of wireless access points. The LWAPP protocol comprises the message categories packet forwarding and access router configuration, which may contain access relevant information.

Page 17, amend the paragraph beginning at line 13 as follows:

Below another exemplary embodiment ~~of the invention~~ is shown on how access relevant information is extracted from messages communicated within a WLAN network. In this example, access relevant information is extracted from messages sent according to a protocol defined by an IEEE emerging standard called 802.11k. This emerging standard will define measurement reports comprising measurements of radio conditions, such as received signal power. It will also define reports comprising load measurements, for example indicating how large portion of the time a WLAN channel is busy, which is indicated by the clear channel assessment (CCA) busy fraction. A WLAN channel is a connection to an access point that can be

used by many terminals. This access relevant information may be extracted from the messages containing the measurement reports by a listening agent placed e.g. in the access point sniffing the channel load reports.

Page 18, amend the paragraph beginning at line 24 and continuing to page 19, line 3 as follows:

Another example of converting access relevant information into comparable quantities describes how to convert a WLAN channel load measurement extracted for example from 802.11k measurement reports to a load measure on a scale between 0-100, i.e. comparable to the load measurements that can be extracted from GSM and/or WCDMA. From the 802.11k measurement reports the measure Clear Channel Assessment (CCA) Busy Fraction is extracted, which contains information of how large portion of the time the channel was busy during the measurement duration, which indicates channel load. As WLAN is using terminal based CSMA (Carrier Sense Multiplex Access) as opposed to WCDMA where the network schedules resources, the delay will increase exponentially for WLAN when the load is increased compared to WCDMA where the delay will in practise be very low until a fully loaded system is reached. Therefore, ~~the invention proposes to introduce~~ a conversion function is introduced to ~~be able to~~ perform a fair comparison between such load measures for CSMA (WLAN) and network based scheduling systems (GSM or WCDMA).

Load_measure_network = F(load measure_csma)

Page 19, amend the paragraph beginning at line 23 as follows:

Figure 9 is a flowchart describing an exemplary embodiment of a method ~~according to the invention~~ for managing radio resources for providing wireless access to a communication system to a number of terminals, wherein the communication system comprises a first access network using a first access technology and at least one second access network using at least one second access technology different from the first access technology.

Page 20, amend the paragraph beginning at line 14 as follows:

As shown in the application, ~~the object of the invention is to achieve~~ a solution is provided for managing radio resources for providing wireless access to a communication system ~~consisting~~ of access networks using different access technologies, and wherein the solution can easily be adapted to manage radio resources for providing wireless access to a system that is expanded with a first access network using a new access technology. This is achieved by receiving access relevant information from the first access network and at least one second access network, wherein the received access relevant information comprises information extracted from messages sent within the first access network. It is further achieved by comparing the received access relevant information extracted from messages sent within the first access network to access relevant information received from the at least one second access network, and determining which access network a terminal should access based on the comparison of the received access relevant information extracted from messages sent within the first access network to the access relevant information received from the at least one second access network.

Page 20, amend the paragraph beginning at line 30 as follows:

In the drawings and specification, there have been disclosed preferred embodiments and examples ~~of the invention~~ and, although specific terms are employed, they are used in a generic and descriptive sense only and not for the purpose of limitation~~, the~~. The scope of the invention ~~being~~is set forth in the following claims.